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# Southern Pine BEETLE NEWS

No. 19, April 1980

## Cut-and-Leave Favored Over Cut-and-Top Technique

The spread of southern pine beetle infestations is worse when trees are cut, delimbed, and topped (cut-and-top technique) than when trees are cut and the crowns left intact (cut-and-leave technique). To check these SPB dispersion patterns, researchers coated the bark of felled trees before the beetles emerged with  $^{32}\text{P}$  (phosphorus), a high-energy-level isotope considered safe for users wearing protective clothing.

The cut-and-top technique was evaluated on SPB-infested shortleaf pines in North Carolina during winter. For a laboratory examination for radioactivity, investigators removed all pitch tubes from randomly selected, infested trees within a radius of 550 m. A little more than a month after the study began, investigators found infestations with radio-tagged beetles as far as 356 m from the test site. Of the trees sampled in these spots, 75 percent had radio-tagged southern pine beetles. Some SPB evidently came from areas other than the test site because infested trees at each spot also contained untagged beetles.

A summer study of the cut-and-leave technique was conducted in Louisiana on SPB-infested loblolly pines. Investigators checked fresh pitch tubes for radioactivity with a portable ratemeter that did not disturb the infested bark. Two newly infested trees with radio-tagged beetles were found 10 m from the test site, and another infested tree was found 183 m away. None of these trees died, and none had untagged beetles. Investigators reasoned that beetles

surviving the cut-and-leave technique were too few to successfully overcome new trees within 500 m of the test site.

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G. E. Moore  
Southeastern Forest Experiment Station  
P.O. Box 12254  
Research Triangle Park, NC 27709

## New Aerial Navigation Equipment Used in Detecting Infestations

The Texas Forest Service now has a plane equipped with the new, low cost Loran-C (TDL-711) navigation system. Using Loran-C, a pilot can keep his plane on the proper flight line. Before this system was installed, the pilot had to rely on observers familiar with the terrain. Although originally designed for marine navigation, the system can operate anywhere.

Loran-C was installed in the plane by the Southeastern Area State and Private Forestry and the Texas Forest Service. It will be pilot tested under the direction of Chuck Dull, Southeastern Area State and Private Forestry, and Joe Pase, Texas Forest Service. For further information, contact Chuck Dull in Northgate Office Park-Rm. 2103, 3620 Interstate 85 NE, Doraville, Ga., 30340, or call 404-221-4796.



## **Academia Looks At the SPB**

At the Duke University School of Forestry and Environmental Studies, Dr. William Thompson is evaluating costs of selected southern pine beetle management options. To obtain information for his economic analysis, Thompson will be contacting managers of the SPB Program, technology transfer team leaders and members, selected principal investigators, and Forest Insect and Disease Management personnel.

At the University of Pittsburgh, an interdisciplinary team is evaluating the SPB Program. The team is surveying opinions about the effectiveness of the program's planning, organization, management, and accomplishments, and its ability to inform the public about its progress. The evaluation will compare the accelerated approach with its increased costs to the "business as usual" approach. Results of the evaluation will be published in 1981.

The Pittsburgh evaluation team was formed late in 1977. It has already released a report on the Douglas-fir tussock moth and the gypsy moth (Cleland, D.I., et al. 1979. Program evaluation of the USDA Combined Forest Pest Research and Development Program. U.S. Dep. Agric. Res. Agmt. No. OS-78-07, 283 p.). These two programs ended Sept. 30, 1978. The SPB Program will end Sept. 30, 1980.

### **Methods Compared for Sampling Phoretic Mites on Pine Beetles**

The development of sampling procedures for estimating southern pine beetle populations has generated interest in improving methods for collecting the phoretic mites that ride on the beetle. Louisiana investigators found that emergence traps provided more reliable counts of phoretic mites than estimates obtained from 100-cm<sup>2</sup> bark disks or 1,000-cm<sup>2</sup> short logs or bolts.

Researchers collected 15 mite species from 6 loblolly pine trees infested with southern pine beetles in pupal and callow adult stages. Upper, middle, and lower bole sections were analyzed, but no significant differences were found in the total number of phoretic mites.

Researchers preferred emergence traps when sampling a few large trees and bolts when sam-

pling many small trees. However, bolts were more difficult to cut, transport, and cage.

The least satisfactory method of collecting mites was disk sampling. Nonphoretic stages remained in disk samples, but few nonphoretic stages were collected from traps or bolts. Some mites were left on the wood when the disk was removed from the tree, while other mites escaped when the bark's inner surface was exposed during holding. In addition, exposure of the large surface areas of the disk samples caused the phloem to dry quickly, killing some mite species. Researchers advise that disk samples should be held in small, sealed containers to minimize the number of mites lost through escape and desiccation.

KINN, D. N.

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D. N. Kinn

Southern Forest Experiment Station  
2500 Shreveport Highway  
Pineville, LA 71360

### **Stand Hazard Rating System Becomes Popular Conference Topic**

This winter, three daylong conferences were held on how to rate susceptibility of pine stands to southern pine beetle attack. In January, Roger Belanger, Southeastern Forest Experiment Station, conducted a stand hazard rating workshop in Atlanta for the Corps of Engineers, South Atlantic Division. In February, Belanger met with Jim Hyland, Alabama Forestry Commission, to discuss a hazard rating system for Alabama's small landowners. And in March, Garland Mason, Stephen F. Austin State University, conducted a program for forest managers in east Texas. He was assisted by Belanger, Ray Hicks of West Virginia University, and Ed Barron and Ron Billings of the Texas Forest Service.

### **SPB Activity Down in 1978**

Southern pine beetle activity dramatically decreased in 1978, according to a U.S. Department of Agriculture report on insect conditions in the South.



In Texas, Arkansas, Mississippi, and Louisiana, only one-tenth as many SPB infestations were detected in 1978 as in 1977. For example, in east Texas more than 4,000 infestations were reported in 1977, while only 50 SPB spots were reported in 1978. Southern pine beetle activity was extremely low in Virginia, Kentucky, Tennessee, Florida, and North and South Carolina from the summer of 1976 to 1978.

Following are the number of infestations and the volume of timber salvaged from January through September 1978.

	Number of Infestations	Volume Salvaged	
		MBF	Cords
Alabama	0	0	0
Arkansas	171	138	1,409
Louisiana	34	10	230
Mississippi	299	273	1,794
Oklahoma	108	...	...
Texas	50	13	102
Total	662	434	3,535

#### U.S. DEPARTMENT OF AGRICULTURE.

1979. Forest insect and disease conditions in the South, 1978. U.S. Dep. Agric., For. Rep. SA-FR4, p. 3-5.

### Book Published On Insect Suppression

A new book entitled "The Basic Principles of Insect Suppression and Management" is on sale from the U.S. Government Printing Office. Southern pine beetle control is specifically referred to in a section on insect sex attractants, commonly called sex pheromones.

The author thinks entomologists need to understand the conditions necessary for the beetle to respond to the attractant. He warns that the efficiency of traps will depend on how strong the artificial pheromones are and how many sources of natural attraction occur in the studied area. Experiments conducted over large areas are recommended because of the movement of the beetles. The author cautions that an uncoordinated and limited attack on the pests will not provide lasting solutions.

Other means of insect suppression discussed in the book include the use of plant varieties resistant to insects; chemical insecticides and sterilants; regulation by biological and microbial agents; cultural and environmental control measures; parasites; and combinations of these approaches.

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### Models Classify SPB Susceptibility

Three models for ranking forest stand susceptibility to southern pine beetle attack have been developed from a study of beetle-infested and noninfested stands. Data came from 245 SPB infestations on a 2,235,000-acre (904,471 ha) area of industrial forest holdings in Louisiana, east Texas, and southern Mississippi.

Study findings supported earlier research. Beetle activity was greater in denser, slower-growing stands with heavy understory vegetation and in sites having low surface and subsoil pH, low subsoil clay, and a higher site index.

Investigators used discriminant analysis techniques to compare the data from infested and noninfested stands. In the first model, variables were selected that best discriminated between infested and noninfested plots. This process continued until no significant improvements were made by adding additional variables. A second model restricted the selection process to the investigators' commonly measured variables: pine basal area, age, stand density, site index, and total basal area per acre. Neither of these models could be used by a forest manager who has limited resources for collecting field data and who has no continuous forest inventory (CFI) data.

For managers without CFI data, researchers developed a third model that correctly classified 93 percent of the infested plots and 65 percent of the noninfested plots. The model was based only on pine basal area and the rate of radial growth during the past 10 years. With such a simple



U. S. DEPARTMENT OF AGRICULTURE  
SOUTHERN PINE BEETLE PROGRAM  
ALEXANDRIA FORESTRY CENTER  
2500 SHREVEPORT HIGHWAY  
PINEVILLE, LA. 71360

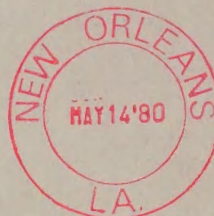
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model, forest managers can quickly evaluate stand susceptibility within a limited geographic area and apply corrective treatments to reduce future losses.

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Ronald J. Kushmaul  
Ouachita National Forest  
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## Other Publications of Interest

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